Test Report for
EAC 2005 VVSG Certification Testing Performed on Election Systems & Software Voting System 5.2.0.4

EAC CERTIFICATION NUMBER: ESSEVS5204

Issue Date: 04/26/2016

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REVISIONS

Revision	Reason for Revision	Date
NR	Initial Release	04/14/2016
A	Changed the word “fielded” to field. Pg. 16	4/20/2016
A	Clarified that the deficiencies were found in the three bulleted categories. Pg. 20	4/20/2016
B	Added EAC certification number	4/26/2016

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1.0 INTRODUCTION

The purpose of this National Certification Test Report is to document the results of the certification testing performed on Election Systems & Software's (ES&S), herein referred to as manufacturer, Election Systems & Software Voting System 5.2.0.4 (EVS 5.2.0.4). EVS 5.2.0.4 was tested to the requirements set forth in the U.S. Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines Standards (2005 VVSG). EVS 5.2.0.4 is a modification to the previously 2005 VVSG certified EVS 5.2.0.0 voting system (Certification number: ESSEVS5200), and was tested by NTS Huntsville based on the "modified system" requirements set forth in section 4.6.2.3 of the EAC Testing and Certification Program Manual, Version 2.0, herein referred to as the Program Manual.

1.1 Description of EAC Certified System Being Modified

The following subsection describes the EAC Certified System that is baseline for the submitted modification. All information was derived from the previous Certification Test Report and/or EAC Certificate of Conformance.

1.1.1 Baseline Certified System

The baseline system for this modification is the EVS 5.2.0.0. Tables 1-1 and 1-2 describe the hardware and software/firmware versions submitted for certification testing. For a complete description of the configuration and description of the EVS 5.2.0.0 product, refer to the EVS 5.2.0.0 Test Report located on the EAC's website at http://www.eac.gov.

Table 1-1. Baseline Certified Software

Software	Software/Firmware Version
Proprietary Software	
ElectionWare	4.6.0.0
Election Reporting Manager (ERM)	8.11.0.0
ES&S Event Log Service (ELS)	1.5.5.0
Removable Media Service (RMS)	1.4.5.0
VAT Previewer	1.8.6.0
ExpressVote Previewer	1.4.0.0
COTS Software	
Adobe Acrobat Standard	11
Cerberus FTP	6.0.7.1
Microsoft Server 2008	2008 R2 w/ SP1
Microsoft Windows 7, SP1	7 w/ SP1
WSUS Microsoft Windows Offline Update Utility	8.8
Symantec Endpoint Protection Intelligent Updater	20131227-002-v5i64.exe
Micro Focus RM/COBOL Runtime	12.06
Symantec Endpoint Protection - Small Business Edition 2013	12.1.4

1.1.1 Baseline Certified System (Continued)

Table 1-2. Baseline Certified Voting System Equipment.

Component	Hardware Version	Firmware Version
Proprietary Hardware		
ExpressVote Accessible Voting Station	1.0	1.4.0.0
DS200 Precinct Count Scanner	1.2.1, 1.2.3, & 1.3	2.12.0.0
DS850 Central Count Scanner	1.0	2.10.0.0
AutoMARK A100	1.0	1.8.6.0
AutoMARK A200 (SBC 2.0 & SBC 2.5)	1.1	1.8.6.0
AutoMARK A300 (SBC 2.0 & SBC 2.5)	1.3	1.8.6.0
Plastic Ballot Box	1.2 & 1.3	N/A
Metal Ballot Box	1.0, 1.1, & 1.2	N/A
COTS Hardware		
EMS Server – Dell	PowerEdge T710	N/A
EMS Reporting Workstation – Dell	Optiplex 980	N/A
EMS Reporting Laptop – Dell	E6410	N/A
Motorola QR Code Scanner	DS9208	N/A
Delkin USB Flash Drives	512MB, 1, 2, 4, & 8GB	N/A
Delkin Compact Flash	1GB	N/A
DS850 Report Printer	OKI B430dn & B 431dn	N/A
DS850 Audit Printer	OKI Microline 420	N/A
Avid Headphones	Avid FV 60	N/A
SanDisk CF Card Reader	018-6305	N/A

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1.2 References

- Election Assistance Commission 2005 Voluntary Voting System Guidelines, Volume I, Version 1.0, "Voting System Performance Guidelines," and Volume II, Version 1.0, "National Certification Testing Guidelines," dated December 2005
- Election Assistance Commission Testing and Certification Program Manual, Version 2.0, expiration date June 30, 2018
- Election Assistance Commission Voting System Test Laboratory Program Manual, Version 2.0, expiration date June 30, 2018
- National Voluntary Laboratory Accreditation Program NIST Handbook 150, 2006 Edition, "NVLAP Procedures and General Requirements (NIST Handbook 150)," dated February 2006
- National Voluntary Laboratory Accreditation Program NIST Handbook 150-22, 2008 Edition, "Voting System Testing (NIST Handbook 150-22)," dated May 2008
- United States 107th Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- Test Guidelines Documents: EMI-001A, Test Guidelines for Performing Electromagnetic Interference (EMI) Testing," and EMI-002A, "Test Procedure for Testing and Documentation of Radiated and Conducted Emissions Performed on Commercial Products"
- NTS Quality Assurance Program Manual, Revision 7
- ANSI/ISO/IEC 17025:2005 and ANSI/NCSL Z540.3, "Calibration Laboratories and Measuring and Test Equipment, General Requirements"
- ISO 10012:2003, "Quality Assurance Requirements for Measuring Equipment"
- EAC Requests for Interpretation (RFI) (listed on www.eac.gov)
- EAC Notices of Clarification (NOC) (listed on www.eac.gov)
- EAC Quality Monitoring Program residing on:

  http://www.eac.gov/testing_and_certification/quality_monitoring_program.aspx
- NTS Test Report No. T71379.01-01 Rev B – National Certification Test Report for Certification Testing of the Election Systems & Software EVS 5.2.0.0 Voting System
- ES&S EVS 5.2.0.0 Technical Data Package
- ES&S EVS 5.2.0.4 Technical Data Package

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1.3 Terms and Abbreviations

Table 1-3 defines all terms and abbreviations applicable to this Test Report.

Table 1-3. Terms and Abbreviations

Term	Abbreviation	Definition
Anomaly	--	Any non-repeatable testing event that is not the expected result or interrupts the test operations.
Americans with Disabilities Act 1990	ADA	ADA is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability.
Configuration Management	CM	Systems engineering process for establishing and maintaining consistency of a product's performance, functional and physical attributes with its requirements, design and operational information throughout its life
Commercial Off-the-Shelf	COTS	Commercial, readily available hardware or software.
Deficiency	--	Any repeatable test result that was not the expected result or violates a requirement of the 2005 VVSG.
United States Election Assistance Commission	EAC	Commission created per the Help America Vote Act of 2002, assigned the responsibility for setting voting system standards and providing for the voluntary testing and certification of voting systems.
ES&S Event Log Service	ELS	ES&S Event Log Service is a Windows Service that runs in the background of any active ES&S Election Management software application to monitor the proper functioning of the Windows Event Viewer
Election Management System	EMS	Within the EVS 5.2.0.4 voting system, the EMS is comprised of five components: Electionware, ERM, ES&S Event Log Service, VAT Previewer and ExpressVote Previewer.
Election Reporting Manager	ERM	EMS reporting component.
Election Systems and Software	ES&S	Identified vendor doting the equipment under test as part of this test plan.
Engineering Change Order	ECO	--
Equipment Under Test	EUT	Refers to the individual system component or multiple piece of the same component
ES&S Voting System	EVS	Proprietary equipment owned by ES&S
ES&S Export Utility	EXP	Export utility, part of ERM.
Functional Configuration Audit	FCA	Verification of system functions and combination of functions cited in the manufacturer's documentation.
Help America Vote Act	HAVA	Act created by United States Congress in 2002.
Institute of Electrical and Electronics Engineers	IEEE	--
Intelligent Mark Recognition	IMR	Visible light scanning technology to detect completed ballot targets.

1.3 Terms and Abbreviations (Continued)

Table 1-3. Terms and Abbreviations (Continued)

Term	Abbreviation	Definition
National Institute of Standards and Technology	NIST	Government organization created to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhances economic security and improves our quality of life.
Notice of Clarification	NOC	Provides further guidance and explanation on the requirements and procedures of the EAC's Voting System Certification or Voting System Testing Laboratory programs.
Personal Computer	PC	Computer component of the EVS 5.2.0.4 voting system.
Quality Assurance	QA	Administrative and procedural activities implemented as a way of preventing mistakes or defects.
Quantity	QTY	Number/Count of items
Quick Response Code	QR Code	Two-dimensional barcode
Request for Interpretation	RFI	A means by which a registered Manufacturer or Voting System Test Laboratory (VSTL) may seek clarification on a specific Voluntary Voting System Guidelines (VVSG) standard.
System Under Test	SUT	Refers to the system as a whole (all components)
Technical Data Package	TDP	Manufacturer documentation related to voting system required to be submitted as a precondition of testing.
Trusted Build	---	Final build of source code performed by a trusted source and overseen by the manufacturer which is delivered to the EAC designated repository; also referred to as a “Witness Build”.
Underwriters Laboratories Inc.	UL	Safety consulting and certification company
Uninterruptible Power Supply	UPS	Electrical apparatus providing emergency power when an input power source fails.
Voter Assist Terminal	VAT	Electronic ballot marking device component is the ES&S AutoMARK.
National Technical Systems, Inc.	NTS	Identified VSTL hosting the testing of the equipment listed in this test plan; facilities located in Huntsville, Alabama.
National Voluntary Laboratory Accreditation Program	NVLAP	Program which provides an unbiased third-party test and evaluation program to accredit laboratories in the respective fields to ISO 17025 standard.
NTS Operating Procedure	OP	NTS Test Method or Test Procedure.
Virtual Review Tool	VRT	Test campaign management software used by the EAC and vendors applying for qualification testing.
Voting System Test Laboratory	VSTL	NTS
Voluntary Voting System Guidelines	VVSG	EAC Voluntary Voting System Guidelines Version 1.0.

2.0 CERTIFICATION TEST BACKGROUND

NTS Huntsville is an independent testing laboratory for systems and components under harsh environments, including dynamic and climatic extremes as well as the testing of electronic voting systems. NTS Huntsville holds the following accreditations:

- ISO-9001:2000
- NVLAP Accredited ISO 17025:2005
- EAC Accredited VSTL, NIST 150,150-22
- A2LA Accredited (Certification No.'s 0214.40, 0214.41, and 0214.42)
- FCC Approved Contractor Test Site (Part 15, 18)

2.1 Revision History

Table 2-1 describes the version history of the submitted voting system.

Table 2-1. Voting System Revision History

System Version	Certification Type	System Modified	Certification Date	Certification Number
EVS 5.0.0.0	New System	Original	05/16/2013	ESSEVS5000
EVS 5.0.1.0	Modification	EVS 5.0.0.0	03/18/2014	ESSEVS5010
EVS 5.2.0.0	Modification	EVS 5.0.0.0	07/02/2014	ESSEVS5200
EVS 5.2.0.4	Modification	EVS 5.2.0.0	4/25/2016	ESSEVS5204

2.2 Known Field Issues

The EVS 5.2.0.0 voting system has one identified field issue. The RSA Crypto suite used by ElectionWare to generate RSA keys will sometimes create a key that is too short. This causes a key mismatch issue when loading the keys into ExpressVote. This issue is present in the submitted EVS 5.2.0.4 system. A detailed description of this issue is provided in Appendix F – ES&S Technical Bulletin #FYIEWR0026.

2.3 Scope of Testing

The focus of the test campaign was to verify functionality of EVS 5.2.0.4 submitted by the manufacturer for EAC certification.

This report is valid only for the system identified in Section 2.3.2 Description of EAC Certified System Being Modified. Any changes, revisions, or corrections not listed in this report or made to the system after this evaluation are required to be submitted to the EAC for assessment.

2.3.1 Modification Overview

Election Reporting Manager has been modified to increase the maximum number of candidates supported in a single contest from 200 to 295 to accommodate customers with a statewide Presidential Delegate contest which exceeded the previous limitation.

2.3.2 Test Materials

EVS 5.2.0.4 proprietary and COTS software submitted by the manufacturer for testing are listed in Table 2-2. Proprietary hardware and COTS are listed in Table 2-3.

Table 2-2. Required Voting System Software

Software	Software/Firmware Version
Proprietary Software	
ElectionWare	4.6.0.0
Election Reporting Manager (ERM)	8.11.0.1
ES&S Event Log Service (ELS)	1.5.5.0
Removable Media Service (RMS)	1.4.5.0
VAT Previewer	1.8.6.0
ExpressVote Previewer	1.4.0.0
COTS Software	
Adobe Acrobat Standard	11
Cerberus FTP	6.0.7.1
Microsoft Server 2008	2008 R2 w/ SP1
Microsoft Windows 7	7 w/ SP1
WSUS Microsoft Windows Offline Update Utility	8.8
Symantec Endpoint Protection Intelligent Updater	20131227-002-v5i64.exe
Micro Focus RM/COBOL Runtime	12.06
Symantec Endpoint Protection - Small Business Edition 2013	12.1.4

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Table 2-3. Required Voting System Equipment

Component	Hardware Version	Firmware Version
Proprietary Hardware		
ExpressVote Accessible Voting Station	1.0	1.4.0.0
ExpressVote Rolling Kiosk	1.0	N/A
DS200 Precinct Count Scanner	1.2.1, 1.2.3, & 1.3	2.12.0.0
DS850 Central Count Scanner	1.0	2.10.0.0
AutoMARK A100	1.0	1.8.6.0
AutoMARK A200 (SBC 2.0 & SBC 2.5)	1.1	1.8.6.0
AutoMARK A300 (SBC 2.0 & SBC 2.5)	1.3	1.8.6.0
Plastic Ballot Box	1.2 & 1.3	N/A
Metal Ballot Box	1.0, 1.1, & 1.2	N/A
COTS Hardware		
EMS Server – Dell	PowerEdge T710	N/A
EMS Reporting Workstation – Dell	Optiplex 980	N/A
EMS Reporting Laptop – Dell	E6410	N/A
Motorola QR Code Scanner	DS9208	N/A
Zebra QR Code Scanner	DS457-SR20009	N/A
Symbol Technologies	DS9208	N/A
Delkin USB Flash Drives	512MB, 1, 2, 4, & 8GB	N/A
Delkin Compact Flash	1GB	N/A
DS850 Report Printer	OKI B430dn & B 431dn	N/A
DS850 Audit Printer	OKI Microline 420	N/A
Avid Headphones	Avid FV 60	N/A
SanDisk CF Card Reader	018-6305	N/A
Delkin CF Card Reader	6381	N/A

Table 3-3 describes the test materials required to execute the required testing.

Table 3-3. Required Test Materials

Test Material	Quantity	Make	Model
Ballot on Demand Printer	1	OKI Data	C9650
ES&S Pens	20	BIC	Grip Roller
Ethernet Switch	1	Dell	HNC67M1
CF Card Reader	1	SanDisk	018-6305
		Delkin	6381

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2.3.3 Block Diagram

EVS 5.2.0.4 is an integrated suite of election management products. Figure 2-1 provides a visual system overview.

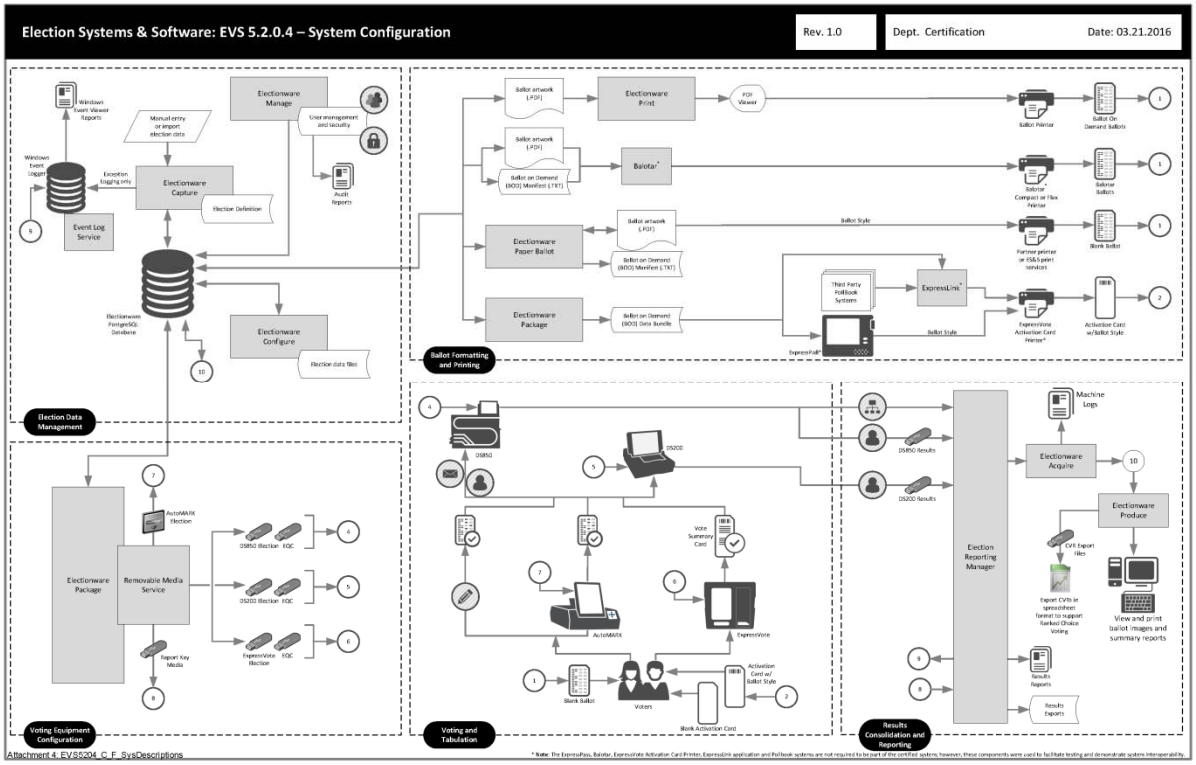

Figure 2-1. EVS 5.2.0.4 System Overview

2.3.4 Supported Languages

The submitted voting system supports English, Spanish, Chinese, Korean, and Japanese.

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2.3.5 RFIs

Table 2-4 lists the applicable RFIs the EAC has released as of the date of the report as it pertains to this test campaign.

Table 2-4. Applicable RFIs

RFI ID	Name
2007-02	EAC Decision on Variable Names
2009-04	EAC Decision on Audit Log Events
2010-02	EAC Decision on Coding Conventions
2010-03	EAC Decision on Database Coding Conventions
2010-05	EAC Decision on Testing of Modifications to a Certified System
2010-07	EAC Decision on Module Length
2010-08	EAC Decision on Calling Sequence
2012-04	EAC Decision on Software Setup Validation
2013-03	EAC Decision on Timestamps

2.3.6 NOCs

There are no applicable NOCs as of the date of the report as it pertains to this test campaign.

3.0 TEST FINDINGS

The EVS 5.2.0.4, as identified in Section 2.3.2 of this report, was subjected to the tests as summarized in this section.

3.1 Anomalies

NTS Huntsville defines an anomaly as any unexpected result and/or event that deviates from what is standard, normal, or expected in which no root cause has been determined. All anomalies are logged and monitored throughout the test campaign and subsequent testing efforts. Anomalies may become deficiencies when a root cause is established.

3.2 Deficiencies and Resolutions

NTS Huntsville defines a deficiency as any repeatable test result or event that is counter to the expected result or violates the specified requirements. Deficiencies are placed into the NTS deficiency tracking system (Jira) and the EAC's Virtual Review Tool (VRT) for disposition and resolution.

Any deficiencies identified during testing are summarized in the summary findings of the respective test section of the test report and their resolutions are presented in their entirety in Appendix B – Deficiency Report.

3.3 Summary Findings

Description of the test and findings are summarized in this section.

3.3.1 System Level Testing

System-level testing examines the ability of proprietary software, hardware, and peripherals in addition to the COTS software, hardware, and peripherals to operate as a complete system. NTS Huntsville utilizes test cases designed to ensure that integrated components function as specified by the manufacturer's documentation and meet the requirements of the VVSG.

3.3.1.1 TDP Review

The EVS 5.2.0.4 TDP was reviewed to the 2005 VVSG. This review was performed as part of the testing activities. The TDP review only included the revised and new documents submitted for this testing campaign. The documents were reviewed for accuracy, completeness, and compliance to the 2005 VVSG.

The review results were recorded in a worksheet that provided the pass/fail compliance to each applicable VVSG requirement. The discovered deficiencies were reported to the manufacturer and internally tracked by NTS Huntsville as test exceptions until verified that the applicable documents had been corrected. The manufacturer corrected nonconformance observations and resubmitted the associated documents for review. This process continued until the TDP complied with the applicable TDP standards in the EAC 2005 VVSG.

Summary Findings

There were four TDP deficiencies in three categories discovered during this test campaign. A summary of the TDP issue encountered are provided below:

- Software/firmware version listed in TDP differed from the software/firmware version installed on hardware
- ERM limits conflicted
- Blank pages

All TDP deficiencies were resolved by ES&S prior to completion of testing.

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3.3.1.2 Physical Configuration Audit (PCA)

A Physical Configuration Audit (PCA) was performed as part of the testing activities in accordance with Section 6.6 of Volume II of the VVSG. The PCA compares the voting system components submitted for certification with the vendor's technical documentation and confirms that the documentation submitted meets the requirements of the Guidelines. The PCA included the following activities:

- Establishing a configuration baseline of software and hardware to be tested; confirm whether manufacturer's documentation is sufficient for the user to install, validate, operate, and maintain the voting system;
- Verifying software conforms to the manufacturer's specifications; inspect all records of manufacturer's release control system; if changes have been made to the baseline version, verify manufacturer's engineering and test data are for the software version submitted for certification;
- Reviewing drawings, specifications, technical data, and test data associated with system hardware, and to establish system baseline;
- Reviewing manufacturer's documents of user acceptance test procedures and data against system's functional specifications; resolve any discrepancy or inadequacy in manufacturer's plan or data prior to beginning system integration functional and performance tests;
- Subsequent changes to baseline software configuration made during testing, as well as system hardware changes that may produce a change in software operation are subject to re-examination.

Summary Findings

A PCA was performed to baseline the system's hardware and software components that were used during the test campaign. The submitted system matched the description provide in the TDP. No discrepancies were noted during the PCA.

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3.3.1.3 Functional Configuration Audit (FCA)

A Functional Configuration Audit of the EVS 5.2.0.4 was performed in accordance with Section 6.7 of Volume II of the VVSG. The purpose of the FCA was to verify that the submitted modification listed in section 2.3.1 performed as documented in the manufacturer supplied technical documentation and to validate that the modifications met the requirements of the EAC 2005 VVSG. The FCA consisted of testing the following components:

- Electionware – Electionware was tested to verify that the system allows for the entry of 295 candidates in a single contest and that the ballot can be generated.
- ERM – ERM was tested to ensure that the system can register the result totals from an election containing 295 candidates in a single contest.
- A negative test was performed on both ERM and Electionware where one more than the maximum supported number of candidates was entered into the system to verify that the software handles the exception properly.

Summary Findings

The FCA demonstrated that the submitted modification performed as documented by the manufacturer. In the process of executing the FCA, two deficiencies were discovered. First, when generating the ballot sets in Electionware an incorrect warning message is presented to user. The second deficiency was that intermittently, in Electionware, one of the items in the equipment list would become unavailable or created media would not appear in the list. Full descriptions of the deficiencies are located in Appendix B. The discovered deficiencies were not corrected prior to test completion.

3.3.1.4 System Integration

In order to further verify that submitted modification did not negatively impact the system, the Kanawha County 2016 Primary Election ballots were utilized across all system components. The Kanawha County is a primary election held in 163 precincts containing 90 contests for a total of 164 polling locations. There are 546 candidates in four parties with one contest having 295 candidates. The results were verified against the expected results matrix. The test decks for system integration included hand marked ballots, AutoMARK generated ballots, and ExpressVote generated ballots. The generated test deck was then utilized for system integration testing on the DS200 and DS850 with all expected results verified within ERM.

Summary Findings

Through System Integration testing, it was demonstrated that the system performed as documented with all components performing their intended functions and the requirements of system integration testing were met.

3.3.2 Source Code Review

All code modified or added subsequent to the EVS 5.2.0.0 source code reviews performed in the prior EAC test campaign was reviewed as part of the 5.2.0.4 test campaign.

Summary Findings

A total of 291 lines of code were reviewed for the EVS 5.2.0.4 test campaign. No deficiencies were discovered during testing.

3.3.3 Quality Assurance /Configuration Management

As part of the modification, NTS Huntsville personnel conducted a QA/CM review to verify that the manufacturer correctly followed their documented processes for a modified system. The QA/CM requirements were spot checked and limited to only the changes included within this modification. NTS Huntsville provided the manufacturer a quality assurance audit list in which the manufacturer was required to complete and deliver within 24 hours. The quality assurance audit utilized the following guidelines as the focus of the review:

The basis of this examination is to ensure:

- Conformance with the requirements to provide information on manufacturer practices required by the 2005 VVSG.
- Conformance of system documentation and other information provided by the manufacturer with the documented practices for quality assurance and configuration management.

The focus of this examination is to assess whether the manufacturer's quality assurance and configuration management program was followed for this modification. The goal of the review was to determine the following:

- Did the manufacturer follow their documented procedures for this modification?
- Was QA and/or Pre-Certification testing performed prior to submitting to the VSTL?
- Were the changes properly communicated to the affected jurisdictions and manufacturer staff?

Summary Findings

ES&S supplied NTS Huntsville with the requested documentation within the allotted 24-hour window. After a review of the information provided, NTS Huntsville determined that ES&S followed the established process for testing modification and communicating to both affected jurisdictions and internal ES&S staff. However, due to the compressed timeline to support elections, portions of the established CM process were not followed.

4.0 RECOMMENDATION FOR CERTIFICATION

NTS Huntsville performed conformance testing on the Election Systems & Software Voting System 5.2.0.4 to the EAC 2005 VVSG. NTS determined that the modification met the requirements of the EAC 2005 VVSG and the manufacturer's technical documentation with the following exception:

- A known field issue is present in the EVS 5204 release. This issue violates Volume II Section 6.7 of the 2005 VVSG.
- The incorrect warning message detailed in section 3.3.1.3 violates the requirements of Volume I Section 2.1.5.1.b and Volume II Section 6.7 of the 2005 VVSG.
- The intermittent disappearance of the election media in the equipment list for ElectionWare violates Volume II Section 6.7 of the 2005 VVSG.
- The results of the QA/CM audit demonstrated a non-conformity to Volume I Section 9.2.

Per Volume 2 Appendix B.5 "…any uncorrected deficiency that does not involve the loss or corruption of voting data shall not necessarily be cause for rejection." Therefore, NTS Huntsville recommends the EAC grant the EVS 5.2.0.4 voting system certification to the EAC 2005 VVSG.

This report is valid only for the equipment identified in Section 2.0 of this report. Due to the varying requirements of individual jurisdictions, it is recommended by the EAC 2005 VVSG that local jurisdictions perform acceptance tests on all systems prior to implementation within their jurisdiction.

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APPENDIX A. ADDITIONAL FINDINGS

A.1 ADDITIONAL FINDINGS REPORT

No additional testing was performed during this campaign.

APPENDIX B. DEFICIENCY REPORT

B.1 DEFICIENCY REPORT

Table B-1 describes the functional deficiencies discovered during the EVS 5.2.0.4 test campaign.

Table B-1. Functional Deficiency Report

EAC VRT ID[1]	Deficiency Summary	Resolutions
337	When generating the ballot sets in Electionware a warning message is presented to user stating that "Warning: 295 Candidates in Contest: REP DELEGATE NAT CONVENTION - AT LARGE exceeds the maximum of 200". The warning message is incorrect as this modification expands the maximum number of candidates per contest to 295.	No resolution provided
338	Intermittently, when creating election media the ballot set would disappear from the equipment list. In addition, sometimes created media was not appearing in the list for created media. After restarting Electionware the media was present.	No resolution provided

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[1] The ID numbers may not be sequential. The deficiency tracking system (VRT) that is utilized by the EAC creates unique ID numbers based on overall entries within the database and not within individual projects.

APPENDIX C. ANOMALY REPORT

C.1 ANOMALY REPORT

No anomalies were discovered during the EVS 5.2.0.4 test campaign.

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APPENDIX D. AS-RUN TEST PLAN

D.1 AS-RUN TEST PLAN

Table D-1 details the change made to the test plan during the course of testing. For a complete description see NTS Test Plan PR046387-01 Rev A.

Table D-1. As-Run Test Plan Changes

Test Plan Section	Description of Change	Justification
6.3.3	Corrected the following: • Number of contest – 90 • Total Candidates – 546 • Number of polling locations - 164	The numbers provided in the approved test plan did not represent those that were tested. The corrected ones were added to this section.

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APPENDIX E. TECHNICAL DATA PACKAGE

E.1 EVS 5.2.0.4 TECHNICAL DATA PACKAGE

The documents listed in Table E-1 comprise the EVS 5.2.0.4 TDP.

Table E-1. EVS 5.2.0.4 TDP

EVS 5.2.0.4 TDP Documents	Version	Doc No.	Document Code
System Overview			
Voting System Overview	1.2	01-01	EVS5204_C_D_0100_SysOvr
System Functionality Description			
System Functionality Description	1.0	02-01	EVS5204_C_D_0200_SFD
System Hardware Specification			
AutoMARK System Hardware Overview	8	03-01	AutoMARK_ESS_System_Hardware _Overview_AQS-18-5002-000-S
AutoMARK System Hardware Specification	6	03-02	AutoMARK_ESS_System_Hardware _Specification_AQS-18-5000-001-F
System Hardware Specification – DS200 HW Rev 1.2	3.0	03-03	DS200HW_M_SPC_0312_HWSpec
System Hardware Specification – DS200 HW Rev 1.3	4.0	03-04	DS200HW_M_SPC_0313_HWSpec
System Hardware Specification – DS850 HW Rev 1.0	1.1	03-05	DS850HW_M_SPC_0310_HWSpec
System Hardware Specification – ExpressVote HW Rev 1.0	3.4	03-06	ExpressVoteHW_M_SPC_0310_HWSpec
Software Design and Specification			
ES&S Coding Standards	3.0	04-01	ESSSYS_D_P_0400_CodingStandards
ES&S System Development Program	2.0	04-02	ESSSYS_SG_P_0400_SystemDevProgram
Software Design Specifications DS200	1.0	04-03	EVS5204_D_SDS00_DS200
Software Design Specifications DS850	1.0	04-04	EVS5204_D_SDS00_DS850
Software Design Specifications Electionware	1.0	04-05	EVS5204_D_SDS00_Electionware
Software Design and Specification – ELS	1.0	04-06	EVS5204_D_SDS00_ELS
Software Design and Specification – ERM	2.0	04-07	EVS5204_D_SDS00_ERM
Software Design and Specification – ERM Appendices	1.0	04-08	EVS5204_D_SDS00_ERM01_Appendices
Software Design and Specification – ExpressVote	1.0	04-09	EVS5204_D_SDS00_ExpressVote
AutoMark Software Design and Specifications	--	04-02	01_AutoMARK Software Design and Specification (Folder)
AutoMARK Ballot Image Processing Specifications	6	04-02-01	AutoMARK ESS Ballot Image Processing Specification AQS-18-5002-003-S
AutoMARK Ballot Scanning and Printing Specification	5	04-02-02	AutoMARK ESS Ballot Scanning and Printing Specification AQS-18-5002-007-S
AutoMARK Driver API Specification	5	04-02-03	AutoMARK ESS Driver API Specification AQS-18-5000-002-F
AutoMARK Embedded Database Interface Specifications	5	04-02-04	AutoMARK ESS Embedded Database Interface Specifications AQS-18-5002-005-S
AutoMARK GUI Design Specifications	6	04-02-05	AutoMARK ESS GUI Design Specifications AQS-18-5001-005-R
AutoMARK Operating Software Design Specifications	5	04-02-06	AutoMARK ESS Operating Software Design Specifications AQS-18-5001-002-R
AutoMARK Operations and Diagnostic Log Specifications	5	04-02-07	AutoMARK Operations and Diagnostic Log Specs AQS-18-5002-004-S
AutoMARK Programming Specifications Details	5	04-02-08	AutoMARK ESS Programming Specifications Details AQS-18-5001-011-R
AutoMARK Software Design Specifications	5	04-02-09	AutoMARK ESS Software Design Specs AQS-18-5001-004-S

E.1 EVS 5.2.0.4 TECHNICAL DATA PACKAGE (CONTINUED)

Table E-1. EVS 5.2.0.4 TDP (Continued)

EVS 5.2.0.4 TDP Documents	Version	Doc No.	Document Code
Software Design and Specification (continued)			
AutoMARK Software Design Specification Overview	1.8	04-02-10	AutoMARK ESS Software Design Spec Overview
AutoMARK Software Development Environment Specifications	5	04-02-11	AutoMARK ESS Software Development Environment AQS-18-5001-006-R
AutoMARK Software Diagnostic Specifications	5	04-02-12	AutoMARK ESS Software Diagnostics Specifications AQS-18-5000-004-F
AutoMARK Software Standards Specification	5	04-02-13	AutoMARK ESS Software Standards Specification AQS-18-4000-000-S
ElectionWare PostgreSQL Table and Field Descriptions	--	04-03	EVS5204_D_SDS00_ElectionWare04_PostgreSQL Table and Field Descriptions (Folder)
Readme Election_ware_4_7_1_0	--	04-03-01	Election_ware_4_7_1_0
Readme Election_ware_admin_4_7_1_0	--	04-03-02	Election_ware_admin_4_7_1_0
System Test and Verification			
EVS5204_QA_D_0500_SysTestPlan	1.0	05-01	EVS5204_QA_D_0500_SysTestPlan
Usability Test	--	05-02	01_UsabilityTestReports (folder)
Common Industry Format ES&S AutoMARK Voter Assist Terminal (VAT)	1.X	05-02-01	AMVATHW_P_D_0510_CIFRptAMVAT
DS200 Precinct Ballot Scanner	1.2.1	05-02-02	DS200HW_P_D_0512_CIFRptDS200
ExpressVote Usability Report 1.0	N/A	05-02-03	ExpressVoteHW_P_D_0509_CIFRptExpressVote
System Security Specification			
AutoMARK System Security Specification	7	06-01	AutoMARK ESS System Security Specification AQS-18-5002-001-S
Network Setup Guide	1.0	06-03	EVS5204_CM_SOP_NetworkConfigGuide
Hardening Procedures for the Election System	1.0	06-04	EVS5204_CM_SPC01_HardeningProcedures
System Security Specification	1.0	06-05	EVS5204_CM_SPC00_SysSecuritySpec
Security Script Description	1.0	06-06	EVS5204_CM_SPC02_SecScriptDesc
System Operations Procedure			
AutoMARK System Operator's Guide	1.0	07-01	EVS5204_DOC_SOP_AMVAT
DS200 Operator's Guide	1.0	07-02	EVS5204_DOC_SOP_DS200
DS850 Operator's Guide	1.0	07-03	EVS5204_DOC_SOP_DS850
ES&S EVS Event Logging Service User's Guide	1.0	07-04	EVS5204_DOC_SOP_ELS
Election Reporting Manager User's Guide	1.0	07-05	EVS5204_DOC_SOP_ERM
Electionware Volume I: Administrator's Guide	1.0	07-06	EVS5204_DOC_SOP_EW01Admin
Electionware Volume II: Define User's Guide	1.1	07-07	EVS5204_DOC_SOP_EW02Define
Electionware Volume III: Design User's Guide	1.0	07-08	EVS5204_DOC_SOP_EW03Design
Electionware Volume IV: Deliver User's Guide	1.0	07-09	EVS5204_DOC_SOP_EW04Deliver
Electionware Volume V: Results User's Guide	1.0	07-10	EVS5204_DOC_SOP_EW05Results
ExpressPass Operator's Guide	1.0	07-11	EVS5204_DOC_SOP_ExpressPass
ExpressVote Operator's Guide	1.0	07-12	EVS5204_DOC_SOP_ExpressVote
System Maintenance Manuals			
ES&S AutoMARK System Maintenance Manual	1.0	08-1	EVS5204_DOC_SMM_AMVAT
DS200 Maintenance Guide	1.0	08-2	EVS5204_DOC_SMM_DS200
DS850 Maintenance Guide	1.0	08-3	EVS5204_DOC_SMM_DS850
ExpressVote Maintenance Guide	1.0	08-4	EVS5204_DOC_SMM_ExpressVote
Personnel Deployment and Training			
Personnel Deployment and Training Program	3.0	09-01	ESSSYS_T_D_0900_TrainingProgram

E.1 EVS 5.2.0.4 TECHNICAL DATA PACKAGE (CONTINUED)

Table E-1. EVS 5.2.0.4 TDP

EVS 5.2.0.4 TDP Documents	Version	Doc No.	Document Code
Configuration Management Plan			
Configuration Management Program	2.0	10-1	ESSSYS_CM_P_1000_CMProgram
ES&S Technical Documentation Program	5.0	10-2	ESSSYS_DOC_P_1000_TDProgram
QA Program			
Manufacturing Quality Assurance Plan	2.0	11-01	ESSSYS_M_P_1100_MNFQualityAssurancePlan
Software Quality Assurance Program	2.0	11-02	ESSSYS_QA_P_1100_SoftwareQualityAssurancePro gram
Software/Firmware Acceptance	2.0	11-03	ESSSYS_QA_L_1100_ SoftwareFirmwareAcceptance
Acceptance Checklists	--	11-02	Acceptance Checklists (folder)
ES&S 1.3 Hardware DS200 Acceptance Checklist	1.3	11-02-01	1 3 Hardware DS200_AccptChklst_001RevA
DS850 Acceptance Checklist	--	11-02-02	850_AccptChklst_revD
DS850 Onsite Acceptance Checklist	--	11-02-03	850_OAccptChklst_revB
AutoMARK VAT Acceptance Checklist	--	11-02-04	AutoMark_AccptChklst_001Rev.A
AutoMARK QC Checklist	--	11-02-05	AutoMark_QC_Chklst_001Rev.A
ES&S DS200 Acceptance Checklist	--	11-02-06	DS200_ AccptChklst_001RevD
ES&S ExpressVote Acceptance Checklist	--	11-02-07	ExpressVote_ AccptChklst_001Rev B
System Change Notes			
System Change Notes	1.2	12-01	EVS5204_DOC_D_1200_ChangeNotes
Other TDP Documents			
ES&S Ballot Production	2.2	13-01	BPG_2'2_SOP

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APPENDIX F – ES&S TECHNICAL BULLETIN #FYIEWR0026

Loading ExpressVote Media: "Manifest Signature Verification Failed"

Technical Bulletin #FYIEWR0026

Product: Electionware

Publication Date: May 11, 2015

Version: EVS4500, EVS520x, EVS5300

Distribution: External

QUESTION: When loading ExpressVote media, how do I avoid the error "Manifest signature verification failed"?

ANSWER: Finalize the ballot layout, regenerate Accessible data, and re-burn the election media.

Background

All files on the media device are digitally signed by Electionware. The equipment uses the digital signatures for security reasons to validate that the files came from a trusted source, and were not changed or modified after being created.

For the Express Vote, these files are signed using the RSA digital signature algorithm. That algorithm can occasionally generate a digital signature with a leading zero byte, and the leading zero is not written to the media device for that file. Therefore, if the leading zero is not written, the ExpressVote will not consider the file valid. This causes a signature mismatch on the ExpressVote.

The likelihood of this occurrence is less than 1 in 250.

Caution

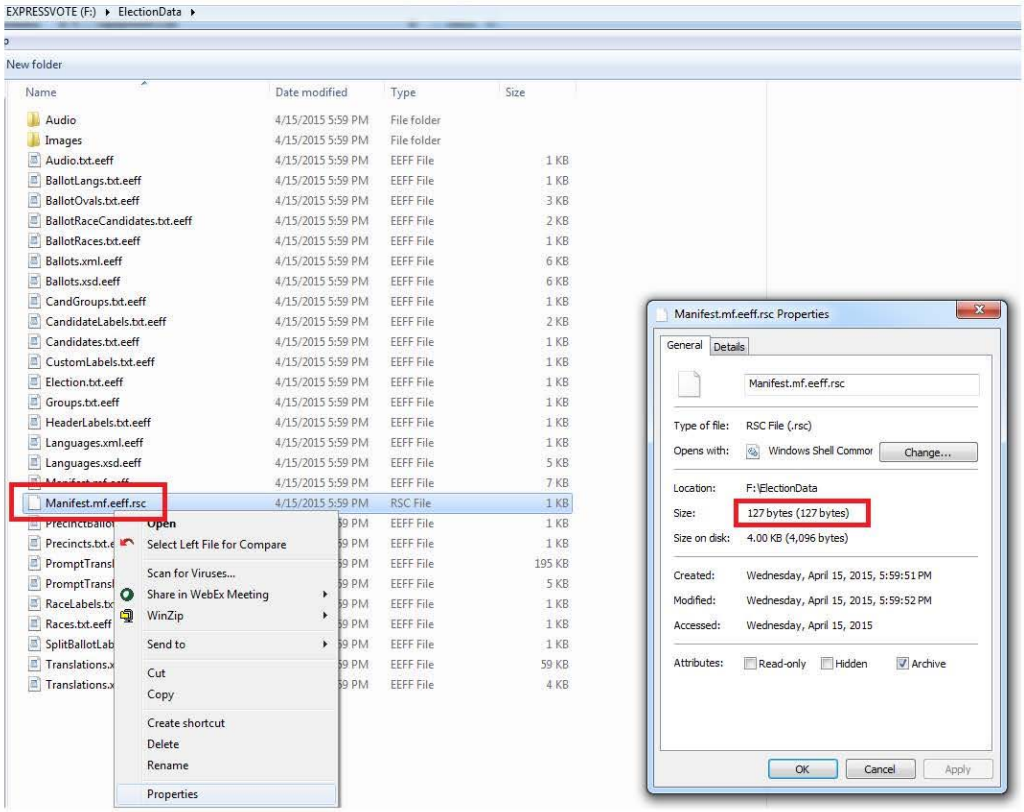
If the error occurs while loading ExpressVote Qualification media, call ES&S Technical Support for assistance as soon as possible.

Check Media Prior to Loading ExpressVote

To check for a mismatch before loading the media on the ExpressVote, first examine two data files in Windows:

1. Insert the media on your computer.
2. In the root folder of the media is a file named Readme.txt.rsc.
   In the ElectionData folder is a file named Manifest.mf.eeff.rsc.
   Right-click each of these files (see the figure on the following page) and select **Properties**.
3. In the Properties window, on the General tab, check the size of the file. If the size of either file is less than 128 bytes, there is a mismatch.

Loading ExpressVote Media: "Manifest Signature Verification Failed"
Technical Bulletin #FYIEWR0026



If a mismatch is discovered (either by checking the file or while loading ExpressVote Election media), perform the following procedure.

Loading ExpressVote Media: "Manifest Signature Verification Failed"
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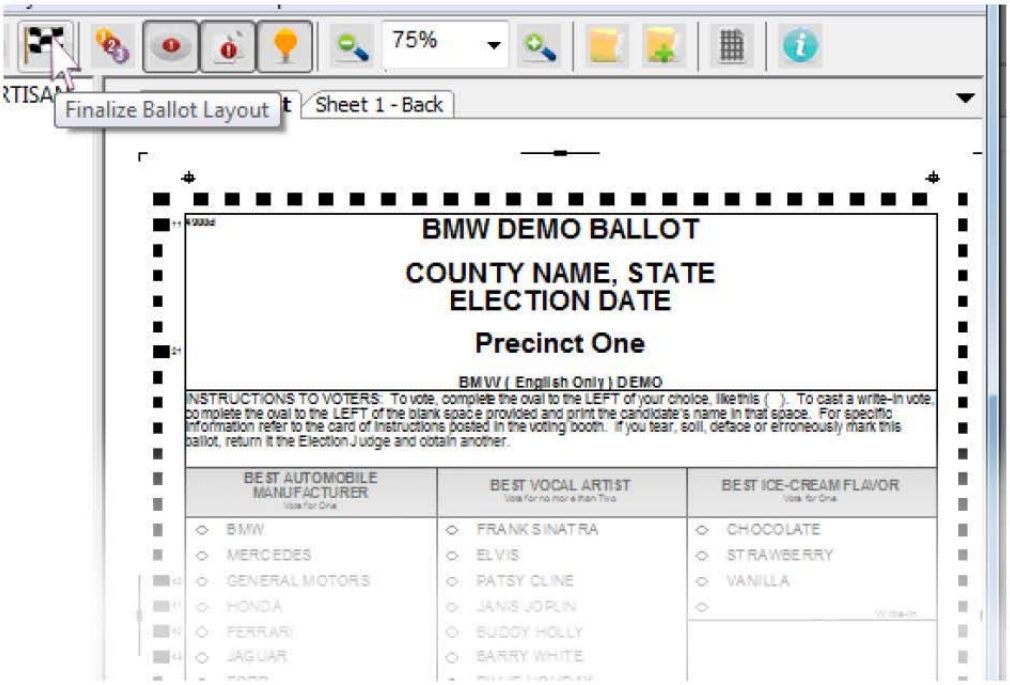
Steps in Electionware

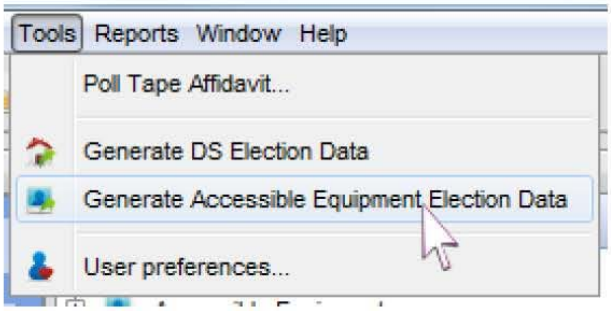
Caution The following procedure takes place after you have finished printing ballots. The only Paper Ballot task in this procedure is to finalize the ballot layout. Do not do anything else in Paper Ballot.

1. In Paper Ballot, finalize the ballot layout.



Warning If you have made formatting changes in Accessible Ballot (i.e. Format Headings, Format Contests, Format Contest Summary, Format Candidates, Format Ballot Styles), these tasks must be repeated after each time you Finalize Ballot Layout in Paper Ballot.

2. In Configure, from the **Tools** menu, regenerate Accessible Equipment Election Data.



3. In Package, recreate the ExpressVote election media for the affected poll.

4. Load the ExpressVote election media. If the error appears again, repeat the steps in Electionware.

Caution

This procedure will cause the error "Inconsistent Data Version" to appear in ERM.

When this message appears, you should always check the version of the data. There is normally only one Electionware data version, but the manifest issue will cause multiple data versions. To bypass the error message when processing media, select **Update**.
However, if there is only one data version, then make sure you have the most up-to-date ERM election loaded.

This issue will be corrected with a new release upon certification. Once available, ES&S will provide the update.

ES&S Support

If you require additional technical support for ES&S products, contact information is provided below.

Contact an ES&S Support Representative	
Telephone:	877-377-8683 (USA & Canada)
Fax:	402-593-8107
Write:	Election Systems & Software 11208 John Galt Blvd Omaha, NE 68137 USA

ES&S support services are subject to the prices, terms, and conditions in place at the time of service.

END OF TEST REPORT